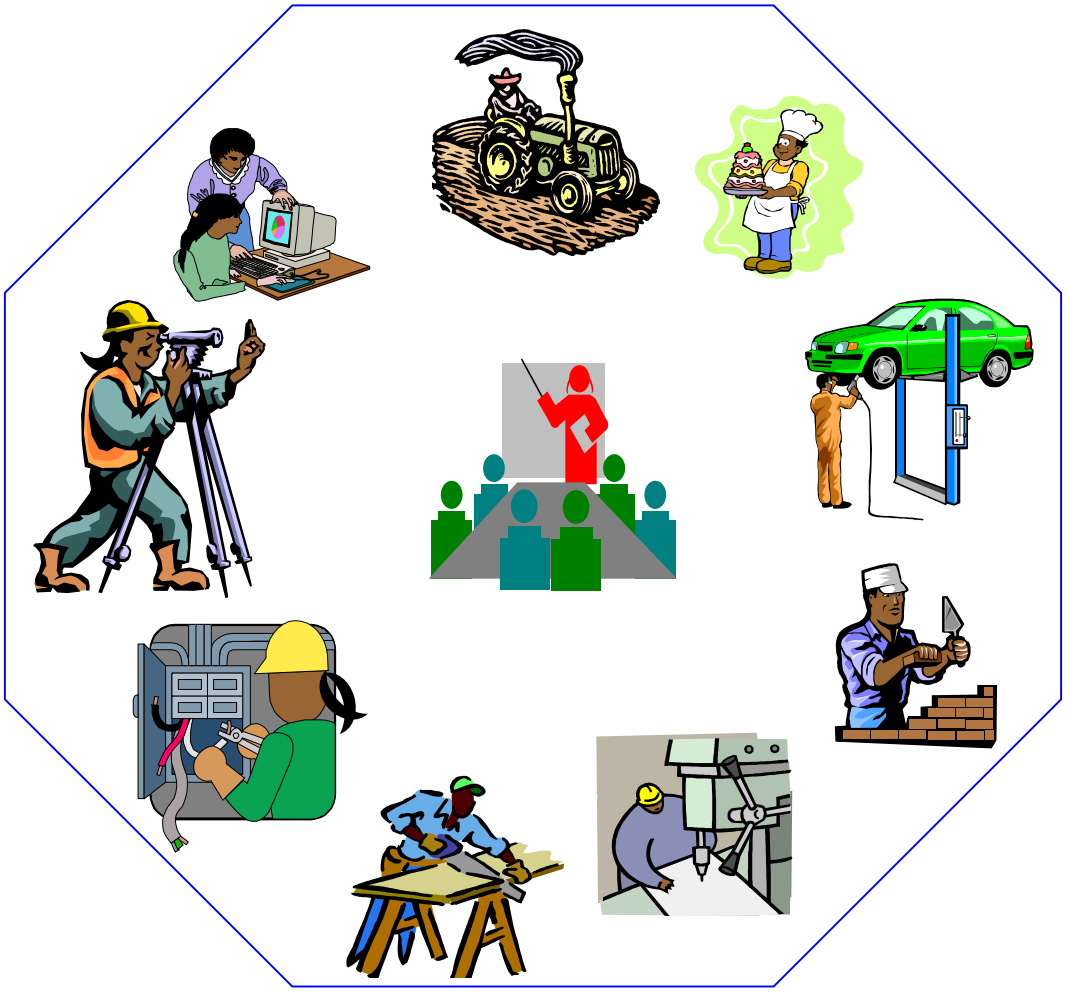
Federal Democratic Republic of Ethiopia

OCCUPATIONAL STANDARD

ELECTRICAL/ELECTRONIC EQUIPMENT SERVICING MANAGEMENT

NTQF Level IV



Ministry of Education

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Introduction

Ethiopia has embarked on a process of reforming its TVET-System. Within the policies and strategies of the Ethiopian Government, technology transformation – by using international standards and international best practices as the basis, and, adopting, adapting and verifying them in the Ethiopian context – is a pivotal element. TVET is given an important role with regard to technology transfer. The new paradigm in the outcome-based TVET system is the orientation at the current and anticipated future demand of the economy and the labor market.

The Ethiopia Occupational Standards (EOS) is the core element of the Ethiopian National TVET-Strategy and an important factor within the context of the National TVET Qualification Framework (NTQF).They are national Ethiopia standards, which define the occupational requirements and expected outcome related to a specific occupation without taking TVET delivery into account.

This document details the mandatory format, sequencing, wording and layout for the Ethiopia Occupational Standard which comprised of Units of Competence.

A Unit of Competence describes a distinct work activity. It is documented in a standard format that comprises:

- Occupational title, NTQF level
- Unit code
- Unit title
- Unit descriptor
- Elements and Performance criteria
- Variables and Range statement
- Evidence guide

Together all the parts of a Unit of Competence guide the assessor in determining whether the candidate is competent.

The ensuing sections of this EOS document comprise a description of the occupation with all the key components of a Unit of Competence:

- chart with an overview of all Units of Competence for the respective level including the Unit Codes and the Unit Titles
- contents of each Unit of Competence (competence standard)
- occupational map providing the technical and vocational education and training (TVET) providers with information and important requirements to consider when designing training programs for this standards and for the individual, a career path

UNIT OF COMPETENCE CHART

Occupational Standard: Electrical/Electronic Equipment Servicing Management

Occupational Code: EEL EES4

NTQF Level IV

EEL EES4 01 0511 Modify/Redesign of Electrical/Electronic Systems	EEL EES4 02 0511 Design and Develop Advanced Electrical/Electronic Systems	EEL EES4 03 0511 Develop Basic and Complex Integrated Security Systems Plan
EEL EES4 04 0511 Manage Servicing Operations for Electronics Equipment/System	EEL EES4 05 0511 Program and Commission Electronic Commercial Security/Equipment Systems	EEL EES4 06 0511 Commission Electronics Equipment/System
EEL EES4 07 0511 Prepare Job Estimation and Costing	EEL EES4 08 0511 Apply Problem Solving Techniques	EEL EES4 09 0511 Perform System Quality Test
EEL EES4 10 0511 Collect, Analyze and Organize Information	EEL EES4 11 0511 Establish Quality Standards	EEL EES4 12 0511 Develop Individual and Teams
EEL EES4 13 0511 Utilize Specialized Communication Skills	EEL EES4 14 0511 Manage and Maintain Small/Medium Business Operations	EEL EES4 15 0511 Migrate to New Technology
EEL EES4 16 1012 Manage Continuous Improvement System		

TOP

Occupational Title: Electrical/Electronic Equipment Servicing Management Level IV	
Unit Title: Modify-redesign of electrical/electronic systems	
Unit Code	**EEL EES4 01 0511**
Unit Descriptor	This competency standard unit covers the modify-redesign of electrical/electronic systems to augment existing systems for clients. It encompasses safe working practices, system parameter reconfiguration, analysis to assure optimum performance, following procedures, and documenting final modifications and settings.

Elements	Performance criteria
Prepare to modify-redesign of electrical/electronic systems	1.1 OHS procedures for a given work area are obtained and understood. 1.2 Established OHS risk control measures and procedures in preparation for the work are followed. 1.3 Safety hazards that have not previously been identified are noted and established risk control measures are implemented. 1.4 Appropriate personnel are consulted to ensure the work is co-ordinate effectively with others involved on the work site. 1.5 System operating parameters are identified by reviewing system specifications and component technical data. 1.6 The limitations, use and operation of the system to be modified is established from original specifications, manufacturers' data and the like 1.7 The extent of modification is determined from measurements, tests, inspections, system limitations and other relevant requirements 1.8 Specifications and instructions for the modifications are documented in accordance with requirements and organizational procedures 1.9 Tools, equipment, applications, and devices needed for the work are obtained in accordance with established procedures and checked for correct operation and safety. 1.10 Reparatory work is checked to ensure no unnecessary damage has occurred and complies with requirements.
2. Generate modification /redesign of electrical/electronics system(s)	2.1 OHS risk control measures and procedures for carrying out the work are followed. 2.2 Alternative modification arrangements are considered and discussed with appropriate personnel

	2.3 Safety, functionality and economic considerations are incorporated in the proposed modification design 2.4 Decisions for dealing with unexpected situations are made from discussions with appropriate persons and job specifications and requirements. 2.5 Methods for dealing with unexpected situations are selected on the basis of safety and specified work outcomes. 2.6 Modification-redesign is carried out efficiently without unnecessary waste of materials or damage to apparatus, the surrounding environment or services and using sustainable energy principles.
3. Completion and reporting of Modification/redesign activities.	3.1 OHS risk control work completion measures and procedures are followed. 3.2 Proposed modification is checked under established procedures for compliance with all relevant requirements 3.3 Work site is cleaned and made safe in accordance with established procedures 3.4 Proposed modification is submitted for appropriate organizational approval and, where applicable, statutory or regulatory approval. 3.5 Approved copies of the modification-redesign documents are issued, and copies retained, documented and stored in records in accordance with established procedures and requirements

Variables	**Range statement**
Unit scope	This competency standard unit shall be demonstrated in relation to modifying/redesigning electronics and communications systems across two different and representative types of electronics and communications systems and associated components and controls.
Occupational Health & Safety (OH&S)	Check the equipment before you turn on for testing, Attention when using test instruments, Inject proper amount of audio/video signal, Proper handling of measuring device, Use heat sink while soldering and disordering, Disconnect battery when AC source is used, Disconnect AC screw when DC battery is used, Impedance of speaker must be greater or equal to impedance of amplifier, Unplug AC supply during installation, Remove shorted speaker, Proper handling of electrician hand tools*.*
Tools and Equipment	• Eagle software (designing software), Frequency counter, Blower, Video signal generator, Contact cleaner, Cleaning materials (brush, alcohol, cotton),Screw driver, screw, Pliers, Amplifier, Microphone, Speaker, Multimeter, Oscilloscope,

	Soldering iron, Soldering lead, Tweezers, Signal generator, DC power supply, Brush, Insulation remover, Impedance matching transformer, extension cord, drilling machine, washer.
Types and Sources of Information	• Organization rules, regulations and guidelines, • Related documentations, • Technical manuals • Sharing best practices
Required Knowledge	• Engineering design processes • Occupational Health and Safety principles

Evidence guide	
Critical aspects of competence	• Developing outlines of alternative redesigns. • Developing the modified-redesigned system within the safety and functional requirements and budget limitations. • Documenting and presenting modifications-redesigns effectively. • Successfully negotiating system alteration requests. • Obtaining approval for final modified-redesigned system. • Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items.
Context of assessment	• Competency is assessed in the work place or simulated environment (software). • The unit of competency should be assessed in conjunction with other relevant units in this occupation
Methods of assessment	The competency may be assessed through: • Practical assessment o Interview o Observation • Theoretical exam • Portfolio Assessment (E.g. Certificate from training providers)
Resources for assessment	The following resources MUST be provided: • Workplace or fully equipped assessment location with necessary tools and equipment and consumable materials • Approved assessment tools • Certified assessor /Assessor's panel

TOP

Occupational Title: Electrical/Electronic Equipment Servicing Management Level IV	
Unit of competence: Design and develop advanced Electrical/Electronic systems	
Unit Code	**EEL EES4 02 0511**
Unit Descriptor	This unit covers the design and development of advanced digital systems. It encompasses working safely, following design brief, applying knowledge of digital components/ devices, interpreting device/component specifications, constructing prototype devices, applying programming techniques to programmable devices, testing developed system prototype operation, verifying compliance of the design against the final brief, and documenting design and development work.

Elements	Performance criteria
1. Prepare to design and develop advanced digital systems	1.1 OHS processes and procedures for a given work area are identified, obtained and understood. 1.2 Established OHS risk control measures and procedures are followed in preparation for the work. 1.3 The extent of the proposed digital system development is determined from the design brief or in consultations with appropriate person(s). 1.4 Design development work is planned to meet scheduled timelines in consultation with others involved on the work site. 1.5 Materials and devices/components required for the work are selected on compatibility of their specifications with digital system requirements and project budget constraints. 1.6 Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.
2. Design and develop advanced digital systems.	2.1 OHS risk control work measures and procedures are followed. 2.2 Knowledge of digital devices and systems and compliance standards are applied to the design 2.3 Alternative arrangements for the design are considered based on the requirements outlined in the design brief. 2.4 Safety, functional and budget considerations are incorporated in the design. 2.5 Prototype devices and circuits are constructed and tested for compliance with the design brief and regulatory

	requirements. 2.6 Prototype malfunctions are rectified and retested to ensure effective operation of design. 2.7 Digital system design is documented for submission to appropriate person(s) for approval. 2.8 Solutions to unplanned situation are provided consistent with organization policy
3. Obtain approval for the design.	3.1 The design is presented and explained to client representative and/or other relevant person(s). 3.2 Requests for modifications to the design are negotiated with relevant person(s) within the constraints of organization policy. 3.3 Final design is documented and approval obtained from appropriate person(s). 3.4 Quality of work is monitored against personal performance agreement and/or established organizational or professional standards.

Variables	**Range Statement**
Unit scope	This unit shall be demonstrated in relation to designing and developing an advanced digital system with at least five variables and a mixture of sequential and combinatorial functions.
Occupational Health & Safety (OH&S)	• Check the equipment before you turn on for testing, Attention when using test instruments, Inject proper amount of audio/video signal, Proper handling of measuring device, Use heat sink while soldering and disordering, Disconnect battery when AC source is used, Disconnect AC screw when DC battery is used, Impedance of speaker must be greater or equal to impedance of amplifier, Unplug AC supply during installation, Remove shorted speaker, Proper handling of electrician hand tools*.*
Tools and Equipment	• Logic analyzer, logic clip, logic probe, logic current tracer, logic pulser, IC remover, IC extraction clip, anti-static wrist strap, soldering and de-soldering tools and materials, tool kit
Types and Sources of Information	• Organization rules, regulations and guidelines, • Related documentations, • Technical manuals • Sharing best practices
Required Knowledge	• Digital applications • Electronic testing and measuring devices and techniques • Occupational Health and Safety principles • Electronic Safe working practices

Evidence guide	
Critical aspects of competence	• Developing outlines of alternative designs. • Developing the design within the safety and functional requirements and budget limitations. • Constructing and testing prototype devices and circuits according to design brief and regulatory requirements. • D Documenting and presenting design effectively. • Successfully negotiating design alteration requests. • Obtaining approval for final design. • Verifying compliance of the design against the final brief. • Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items
Context of assessment	• Competency is assessed in the work place or simulated environment (software). • The unit of competency should be assessed in conjunction with other relevant units in this occupation
Methods of assessment	The competency may be assessed through: • Practical assessment o Interview o Observation • Theoretical exam • Portfolio Assessment (E.g. Certificate from training providers)
Resources for assessment	The following resources **MUST** be provided: • Workplace or fully equipped assessment location with necessary tools and equipment and consumable materials • Approved assessment tools • Certified assessor /Assessor's panel

TOP

Occupational Standard Title- Electrical/Electronic Equipment Servicing Management Level IV	
Unit Title: Develop basic and complex integrated security systems plan	
Unit of competence Code	**EEL EES4 03 0511**
Unit Descriptor	This unit covers integrating security components to form a complete security system with up to 100 connected intrusion and access devices and based on common security scenarios. It encompasses applying knowledge of common security scenarios and security network standards and protocols, selecting network ology and physical media, disaster recovery planning, performance management and documentation of work activities.

Elements	Performance Criteria
1. Prepare to develop integrated security systems	1.1 OHS processes and procedures for a given work area are identified, obtained and understood. 1.2 Established OHS risk control measures and procedures are followed in preparation for the work. 1.3 The extent of the proposed integrated security system is determined from the system specification or in consultations with appropriate person(s) 1.4 Development work is planned to meet scheduled timelines in consultation with others involved on the work site
2. Develop integrated security system plan	2.1. Knowledge of common security scenarios and security network standards and protocols, network ology, physical media and disaster planning is applied to the system plan. 2.2. Alternative system arrangements are considered based on the requirements job specification. 2.3. Safety, functional and budget considerations are incorporated in the system plan. 2.4. System draft plan is checked for compliance with the job specifications and regulatory requirements. 2.5. System plan is documented for submission to appropriate person(s) for approval 2.6. Decisions for dealing with unexpected situations are made from discussions with appropriate persons and job specifications and requirements.
3. Obtain approval for	2.1. System design is forwarded to client representative and/or other

system plan	relevant person(s) for approval. 2.2. Requests for alterations to the plan are negotiated with relevant person(s) in accordance with established procedures. 2.3. Final system plan is documented and approval obtained from appropriate person(s). 2.4. Quality of work is monitored against personal performance agreement.

Variables	**Range statements**
Unit scope	This unit covers designing and development of basic and complex security system up to 100 connected intrusions for commercial buildings.
Occupational Health and Safety (OH&S)	• Apply OH&S requirements in accordance with regulations/codes of practice and enterprise safety policies and procedures. This may include: using of relevant protective clothing and equipment, use of hand tools and equipment, workplace environment and safe handling of material, use of fire fighting equipment, enterprise first aid, hazard control and hazardous materials and substances,using chemical proven gowns, rubber boots of appropriate size, Goggles, respirators, helmet, and head phones , gloves etc…,Checking and fulfilling required safety devices before starting operation, Apply safe operating procedures regarding : electrical safety, machinery movement and operation, manual and mechanical lifting and shifting.
Tools and Equipment	▪ Hand tools, Multimeter, cable tester
Types and sources of information	Information source may include : • diagrams or sketches, Occupational health and safety manual, Industry/workplace codes of practice , Organization operating procedures, Workplace guidelines/ workshop manuals, Manufacturer's catalogue/specification manual, Manufacturer's service and operation manuals, Design specification manual, Repair request documentation ,job cards, Manufacturing and designing specifications and instructions, Records and reports, Virtual library.
Required knowledge	• Common security scenarios and solutions • Occupational Health and Safety principles

Evidence Guide	**Description**
Critical aspects of competence	• Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as

	specified in the standard. • Develop basic and complex integrated security systems plan as described above and including: ▪ Developing outlines of alternative system plan. ▪ Developing the plan within the safety and functional requirements and budget limitations. ▪ Documenting the plan effectively. ▪ Obtaining approval for final plan. ▪ Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items.
Context of assessment	• Competency is assessed in the work place or simulated environment (software). • The unit of competency should be assessed in conjunction with other relevant units in this occupation
Methods of assessment	The competency may be assessed through: • Practical assessment o Interview o Observation • Theoretical exam • Portfolio Assessment (E.g. Certificate from training providers)
Resources for assessment	The following resources **MUST** be provided: • Workplace or fully equipped assessment location with necessary tools and equipment and consumable materials • Approved assessment tools • Certified assessor /Assessor's panel

TOP

Occupational Standard: Electronics and Communications Servicing Management Level IV	
Unit Title	**Manage Servicing Operations for Electronics Equipment and System**
Unit Code	**EEL EES4 04 0511**
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to manage servicing operations for electronics products and systems.

Elements	Performance Criteria
1. Plan and prepare management of servicing operations	1.1 Management of servicing and maintenance of ***OHS policies and procedures*** is planned and prepared to ensure that the work sequence is in accordance with ***requirements*** 1.2 ***Appropriate personnel*** are consulted and directed to ensure the programs for servicing and maintenance are coordinated effectively with others involved on the work site 1.3 Programs to be managed for servicing and maintenance are checked against job requirements 1.4 Materials necessary to complete the work are identified and detailed in accordance with established procedures and checked against job requirements 1.5 Tools, equipment and testing devices needed to carry out the work are identified and detailed in accordance with established procedures 1.6 Procurement management plan is formulated for servicing and maintenance in accordance with established procedures and checked against requirements
2 Manage and monitor servicing operation	2.1 Normal function of ***consumer electronics products*** and associated circuits are ascertained and detailed in accordance with requirements 2.2 Mechanisms are used to measure, record and report progress of activities in relation to the agreed servicing and maintenance schedules and plans 2.3 Servicing and maintenance system is managed and monitored in accordance with ***established procedures and***

	requirements to achieve designated objectives 2.4 Response to ***unplanned events or conditions*** in accordance with established procedures are detailed 2.5 Records and documentation of servicing and maintenance activities are maintained in accordance with established procedures to facilitate quality management and to provide an audit trail. 2.6 Results of routine maintenance activities are monitored in accordance with established procedures to determine compliance with agreed quality standards 2.7 Shortfalls in quality outcomes are acted upon in accordance with established procedures to enable appropriate action to be initiated
3 Evaluate and document servicing system	3.1 Quality management issues and responses are reported in accordance with established procedures 3.2 Completion of servicing and maintenance is reported in accordance with established procedures
Variable	**Range**
OHS policies and procedures	Arrangements of an organization or enterprise to meet the legal and ethical obligations of ensuring that the workplace is safe and without risk to health. This may include: • hazardous and risk assessment mechanisms • safety training • implementation of safety regulations • safety systems incorporating - ▪ work clearance procedures ▪ isolation procedures ▪ gas and vapor ▪ monitoring/testing procedures ▪ use of protective equipment and clothing • Use of codes of practice
Requirements	Requirements may include: • codes of practice • job specifications • transport documentation • standards called-up in specifications • procedures and work instructions • quality assurance systems

	• manufacturers' specifications • maintenance manuals, schedules and specifications/standards • circuit/cable schedules • design specifications • customer/client requirements and specifications • specified underpinning knowledge (specified in units' evidence guides) • statutory regulations • national and regional guidelines , policies and directives relating to the environment
Appropriate person	May include but not limited to: • Site managers / Project managers • Engineers • Line managers • Regulatory personnel • Other personnel designated by an organization or enterprise
Electronics products	• Audio and video product • Electronically-controlled domestic appliances • Cellular phones
Established procedures	Formal arrangements of an organization, enterprise or statutory authority of how work is to be done. These may include • Quality assurance systems incorporating, for example: ▪ Continues quality improvement procedures ▪ Work orders / instructions ▪ Reporting procedures ▪ Procurement procedures ▪ Accounting procedures ▪ Human resources development procedures • Work clearance systems incorporating, for example: ▪ Work permits ▪ Monitoring and clearance procedures ▪ Isolation procedures • OHS practices • Procedures for operating safety systems, operating plant and equipment and reporting work activities • Maintenance, modification or supply of relevant schematic drawings and technical data • Arrangements for dealing with emergency situations.

Unplanned events or conditions	May include but not limited to: • Accidents/incidents • Brownout • Equipment breakdown • Force majored e.g., earthquake, fire, typhoon

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • Planned and prepared management of servicing and maintenance in accordance with OH&S policies and procedures • Checked programs to be developed for servicing and maintenance according to job requirements • Identified and detailed tools, equipment and materials needed to carry out work as specified in the user's manual and established procedures • Used mechanisms to measure, record and report progress of activities in relation to the agreed servicing and maintenance schedules and plans • Maintained records and documentation of servicing and maintenance activities • Reported quality management issues and responses in accordance with established procedures
Underpinning Knowledge and Attitudes	• Basic Electronics • Computer operations • Flow charting • Business plan development ▪ Marketing plan ▪ Production plan ▪ Organization and management plan ▪ Financial plan • Laws, and regulation, Electrical and electronic code • Quality improvement ▪ Continuous process Improvement Philosophies and principals ▪ Product/Service Development ▪ Manufacturing Product/providing services ▪ Inspection of raw materials and outgoing product • Management ▪ HR Recourses management ▪ Fiscal management

	▪ ISO 9000 ▪ Procurement management ▪ Records management ▪ Property management
Underpinning Skills	• Formulating Continuous Improvement policies and guidelines • Benchmarking • Preparing process capability control chart • Skills in operation of Basic computer system application • Drawing system and process flow chart
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials, diagrams and manuals, tools, test instruments and equipment, and to information on workplace practices and OHS practices.
Assessment Methods	Competence may be assessed through: • Interview / oral questioning / written exam • Simulation/demonstration • Observation
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting

TOP

Occupational Standard Title- Electrical/Electronic Equipment Servicing Management Level IV	
Unit Title:	**Program and Commission Electronic Commercial Security Equipment/System**
Unit Code	**EEL EES4 05 0511**
Unit Descriptor	This unit covers programming and commissioning of security system typically used in commercial buildings and premises The unit encompasses working safely, following specifications and security access scenarios, programming security alarm functions, using circuit diagrams and schedules, and providing as programmed document.

Elements	Performance Criteria
1. Prepare to program and commission	1.1 OHS procedures for a given work area are identified, obtained and understood. 1.2 Established OHS risk control measures and procedures are followed in preparation for the work. 1.3 Safety hazards, which have not previously been identified, are documented and risk control measures devised and implemented in consultation with appropriate personnel. 1.4 The extent of programming and commissioning is determined from reports and other documentation and fro discussion with appropriate personnel. 1.5 Appropriate personnel are consulted to ensure the work is co-ordinated effectively with others involved on the work site. 1.6 Tools, equipment and testing devices needed to program and commission are obtained in accordance with established procedures and checked for correct operation and safety.
2. Program and commission	2.1 OHS risk control measures and procedures for carrying out the work are followed. 2.2 The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures. 2.3 Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures. 2.4 Security alarm functions and instructions are entered into the system in accordance with design specifications. 2.5 Security alarm devices are checked for correct location and alignment. 2.6 Security alarms are tested in accordance with commissioning requirements.

	2.7 Sources of alarm anomalies are identified and corrected. 2.8 Decisions for dealing with unexpected situations are made from discussions with appropriate persons and job specifications and requirements. 2.9 Methods for dealing with unexpected situations are selected on the basis of safety and specified work outcomes. 2.10 Programming and commissioning activities are carried out efficiently without waste of materials or damage to apparatus and the surrounding environment or services and using sustainable energy practices.
3. Complete and report programming and commissioning	3.1 OHS work completion risk control measures and procedures are followed activities. 3.2 Work site is made safe in accordance with established safety procedures. 3.3 'As-installed' security alarm system is documented and an appropriate person or persons notified in accordance with established procedures.

Variables	**Range statements**
Unit scope	This unit covers the programming and commissioning of commercial security alarm, access control and closed circuit system.
Occupational Health and Safety (OH&S)	• Apply OH&S requirements in accordance with regulations/codes of practice and enterprise safety policies and procedures. This may include: using of relevant protective clothing and equipment, use of hand tools and equipment, workplace environment and safe handling of material, use of fire fighting equipment, enterprise first aid, hazard control and hazardous materials and substances,using chemical proven gowns, rubber boots of appropriate size, Goggles, respirators, helmet, and head phones , gloves etc…,Checking and fulfilling required safety devices before starting operation, Apply safe operating procedures regarding : electrical safety, machinery movement and operation, manual and mechanical lifting and shifting.

Tools and Equipment	▪ Hand tools, Multimeter, cable tester,
Types and sources of information	Information source may include : • diagrams or sketches, Occupational health and safety manual, Industry/workplace codes of practice , Organization operating procedures, Workplace guidelines/ workshop manuals, Manufacturer's catalogue/specification manual, Manufacturer's service and operation manuals, Design specification manual, Repair request documentation ,job cards, Manufacturing and designing specifications and instructions, Records and reports, Virtual library.
Required knowledge	• Security systems alarms programming • Occupational Health and Safety principles • Electronics Safe working practices

Evidence Guide	**Description**
Critical aspects of competence	• Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the standard. • Program and commission commercial security alarm, control and closed circuit systems as described above and including: ▪ Entering system functions. ▪ Testing system functions. ▪ Identifying and correcting function anomalies. ▪ Documenting 'as-installed' system correctly. ▪ Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items.
Context of assessment	• Competency is assessed in the work place or simulated environment (software). • The unit of competency should be assessed in conjunction with other relevant units in this occupation
Methods of assessment	The competency may be assessed through: • Practical assessment o Interview o Observation • Theoretical exam • Portfolio Assessment (E.g. Certificate from training providers)
Resources for assessment	The following resources **MUST** be provided: • Workplace or fully equipped assessment location with necessary tools and equipment and consumable materials

	• Approved assessment tools • Certified assessor /Assessor's panel

TOP

Occupational Title: Electrical/Electronic Equipment Servicing Management Level IV	
Unit Title: Commission Electrical/Electronic Equipment Systems	
Unit Code	**EEL EES4 06 0511**
Unit Descriptor	This competency standard unit covers undertaking commissioning procedures of electronics and communications systems to comply with predetermined parameters and delivery to client. It encompasses safe working practices, system parameter testing, analysis and adjusting to assure optimum performance, following procedures, and documenting final operating parameters and settings.

Elements	Performance criteria
1. Prepare to commission electronics and communications systems	1.1. OHS procedures for a given work area are obtained and understood. 1.2. Established OHS risk control measures and procedures in preparation for the work are followed. 1.3. Safety hazards that have not previously been identified are noted and established risk control measures are implemented. 1.4. Appropriate personnel are consulted to ensure the work is co-ordinated effectively with others involved on the work site. 1.5. System operating parameters are identified by reviewing system specifications and component technical data. 1.6. Tools, equipment, applications, and testing devices needed for the work are obtained in accordance with established procedures and checked for correct operation and safety. 1.7. Preparatory work is checked to ensure no unnecessary damage has occurred and complies with requirements. 1.8. Circuits are checked as being isolated, where necessary, in strict accordance OHS requirements and procedures.
2. Commission electronics and communications systems	2.1. OHS risk control measures and procedures for carrying out the work are followed. . 2.2. Testing/measuring devices are connected and set up in accordance with requirements for a particular system. 2.3. Measurements and adjustments are made to electronics and communications equipment to provide optimum system performance in accordance with system

	specifications and/or regulatory requirements. 2.4. Decisions for dealing with unexpected situations are made from discussions with appropriate person and job specifications and requirements. 2.5. Methods for dealing with unexpected situations are selected on the basis of safety and specified work outcomes. 2.6. Systems' commissioning procedures are performed in accordance with requirements. 2.7. Commissioning is carried out efficiently without unnecessary waste of materials or damage to apparatus, the surrounding environment or services and using sustainable energy principles.
3. Completion and reporting of commissioning activities.	3.1. OHS risk control work completion measures and procedures are followed. 3.2. Adjustment settings are documented in accordance with established procedures. 3.3. Work site is cleaned and made safe in accordance with established procedures. 3.4. Commissioning results and work completion are notified to appropriate person or persons in accordance with established procedures

Variables	**Range Statement**
Unit scope	This competency standard unit shall be demonstrated in relation to commissioning different types of electronics and communications systems and associated components and controls.
Occupational Health & Safety (OH&S)	Check the equipment before you turn on for testing, Attention when using test instruments, Inject proper amount of audio/video signal, Proper handling of measuring device, Use heat sink while soldering and disordering, Disconnect battery when AC source is used, Disconnect AC screw when DC battery is used, Impedance of speaker must be greater or equal to impedance of amplifier, Unplug AC supply during installation, Remove shorted speaker, Proper handling of electrician hand tools*.*
Tools and Equipment	Frequency counter, Blower, Video signal generator, Contact cleaner, Cleaning materials (brush, alcohol, cotton),Screw driver, screw, Pliers, Amplifier, Microphone, Speaker, Multimeter, Oscilloscope, Soldering iron, Soldering lead, Tweezers, Signal generator, DC power supply, Brush, Insulation remover, Impedance matching transformer,

	extension cord, drilling machine, washer.
Types and Sources of Information	• Organization rules, regulations and guidelines, • Related documentations, • Technical manuals • Sharing best practices
Required Knowledge	• Commissioning processes and procedures • Occupational Health and Safety principles • Methods of on – the job training

Evidence guide	**Description**
Critical aspects of competence	• Identifying system design performance parameters and requirements • Measuring and adjusting system components to provide optimum system performance • Ensuring system operates within regulatory and/or specification requirements • Documenting adjustment settings with established procedures • Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed item
Context of assessment	• Competency is assessed in the work place or simulated environment (software). • The unit of competency should be assessed in conjunction with other relevant units in this occupation
Methods of assessment	The competency may be assessed through: • Practical assessment o Interview o Observation • Theoretical exam • Portfolio Assessment
Resources for assessment	The following resources **MUST** be provided: • Workplace or fully equipped assessment location with necessary tools and equipment and consumable materials • Approved assessment tools • Certified assessor /Assessor's panel

TOP

Occupational Standard: Electrical/Electronic Equipment Servicing Management Level IV	
Unit Title	**Prepare Job Estimation and Costing**
Unit Code	**EEL EES4 07 0511**
Unit Descriptor	This unit specifies the competence required to estimate materials, labor and time requirements and establish costs for a basic construction project.

Elements	Performance Criteria
1. Gather information	1.1 Details of the project requirements are obtained from ***information*** supplied 1.2 Details of products and/or services to be provided are compiled 1.3 Delivery point and methods of transportation are determined where necessary 1.4 Details are recorded in accordance with enterprise practice
2. Estimate duration and materials	2.1 Types and quantities of materials required for the construction project are estimated 2.2 Labor requirements to achieve construction outcomes and/or perform required services are estimated 2.3 Time requirements to construct and/or perform required services are estimated
3. Calculate costs	3.1 Total materials, labour and overhead cost allowances are calculated in accordance with enterprise procedures 3.2 Total job cost is calculated, including overheads and mark-up percentages 3.3 Final cost is calculated
4. Document details and verify where necessary	4.1 Details of costs and charges are documented in accordance with enterprise practice 4.2 Costs, calculations or other details are verified in accordance with enterprise practice 4.3 Details are documented for future reference in accordance with enterprise practice

Variable	Range
Information	May include but not be limited to: • verbal or written and graphical instructions, signage, work schedules/plans/specifications, work bulletins, memos, material safety data sheets (msds), diagrams or sketches • safe work procedures related to carrying out basic estimation • manufacturers' specifications and instructions where specified • organization work specifications and requirements • instructions issued by authorized organizational or external personnel

Evidence Guide	
Critical aspects of Competence	Demonstrates skills and knowledge in: • Location, interpretation and application of relevant information, standards and specifications • Compliance with site safety plan and OH&S legislation/regulations/codes of practice applicable to workplace operations • Compliance with organizational policies and procedures including quality requirements • Safe and effective operational use of tools and equipment • Communication and working effectively and safely with others • Document and communicate work related information including: work orders, specifications, products, materials and labour requirements, costing calculations for products, materials and labour, and special conditions for a specified construction project • Estimate and cost a specified project including: ▪ estimate quantities of material required ▪ determine the types and amount of labour required to ▪ complete the work ▪ estimate time required to complete the work ▪ estimate overheads associated with the project

Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • workplace and equipment safety requirements • quality requirements • electronic servicing terminology • tools and equipment types, characteristics, uses and limitations • costing techniques and procedures • materials uses and specifications • processes for the calculation of material requirements • diagrams and specifications • labor rates and overheads • safe work method statements
Underpinning Skills	Demonstrates skills in: • appropriate use of scientific calculator • apply computer aided drafting • apply simple arithmetic methods • ability to visualize and perceive an object in different views • read technical /schematic diagrams
Resource Implications	The following resources must be provided: • Workplace or fully equipped environment with necessary tools and equipment as well as consumable materials
Method of Assessment	Competence may be assessed through: • interview/ written exam / oral questioning • observation/demonstration
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting

TOP

Occupational Standard: Electrical/Electronic Equipment Servicing Management Level IV

Unit Title	Apply Problem Solving Techniques
Unit Code	**EEL EES4 08 0511**
Unit descriptor	This unit of covers the knowledge, skills and attitudes required to solve problems in the workplace including the application of problem solving techniques and to determine and resolve the root cause of problems.

Element	Performance Criteria
1. Identify the problem	1.1 Variances are identified from normal operating parameters; and product quality 1.2 Extent, cause and nature are of the problem are defined through observation, investigation and ***analytical techniques*** 1.3 ***Problems*** are clearly stated and specified
2. Determine fundamental causes of the problem	2.1 Possible causes are identified based on experience and the use of problem solving tools **/** analytical techniques. 2.2 Possible cause statements are developed based on findings 2.3 Fundamental causes are identified per results of investigation conducted
3. Determine corrective action	3.1 All possible options are considered for resolution of the problem 3.2 Strengths and weaknesses of possible options are considered 3.3 Corrective actions are determined to resolve the problem and possible future causes 3.4 **Action *plans*** are developed identifying measurable objectives, resource needs and timelines in accordance with safety and operating procedures
4. Provide recommendation / s to manager	4.1 Report on recommendations are prepared 4.2 Recommendations are presented to appropriate personnel 4.3 Recommendations are followed-up, if required

Variable	Range

Analytical techniques	• Brainstorming • Intuitions/Logic • Cause and effect diagrams • Pareto analysis • SWOT analysis • Gant chart, Pert CPM and graphs • Scatter grams
Problem	• Non – routine process and quality problems • Equipment selection, availability and failure • Teamwork and work allocation problem • Safety and emergency situations and incidents
Action plans	• Priority requirements • Measurable objectives • Resource requirements • Timelines • Co-ordination and feedback requirements • Safety requirements • Risk assessment • Environmental requirements

Evidence guide	
Critical Aspects of Competency	Assessment requires evidence that the candidate: • Identified the problem • Determined the fundamental causes of the problem • Determined the correct / preventive action • Provided recommendation to manager.
Underpinning Knowledge	Competence includes a thorough knowledge and • understanding of the process, normal operating • parameters, and product quality to recognize non- • standard situations • sufficient for the identification of fundamental cause, • determining the corrective action and provision of • recommendations • Relevant equipment and operational processes • Enterprise goals, targets and measures • Enterprise quality, OHS and environmental requirement • Principles of decision making strategies and techniques • Enterprise information systems and data collation • Industry codes and standards

Underpinning Skills	• Using range of formal problem solving techniques • Identifying and clarifying the nature of the problem • Devising the best solution • Evaluating the solution • Implementation of a developed plan to rectify the problem
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials, diagrams and manuals, tools, test instruments and equipment, and to information on workplace practices and OHS practices.
Assessment Methods	Competence may be assessed through: • Interview / oral questioning / written exam • Simulation/demonstration • Observation
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting

TOP

Occupational Standard: Electrical/Electronic Equipment Servicing Management Level IV	
Unit Title	**Perform System Quality Test**
Unit Code	**EEL EES4 09 0511**
Unit Descriptor	This unit covers competence in setting up testing equipment, testing, functionality and inspecting quality of electronic system. it encompasses working safely with electricity, testing device set-up, following testing and inspection procedures, interpreting and reporting testing and inspection results and making recommendations for dealing with defects.

Elements	Performance Criteria
1. Prepare to perform testing and inspection.	1.1 ***OHS*** procedures for a given work area are identified, obtained and understood 1.2 OHS risk control measures for work preparation are followed 1.3 ***Documented*** system functions and quality requirements are identified, obtained and understood 1.4 Testing and ***inspection*** processes and procedures are reviewed and electronic Testing equipment is checked for correct operation and safety 1.5 System testing and inspection is coordinated with others involved in the work to ensure work schedules are met and safety measures are followed
2. Perform system tests	2.1 OH&S risk control work measures and procedures are followed 2.2 The need to test or measure live is determined in strict accordance with OH&S requirements and when necessary conducted within established safety procedures 2.3 ***System*** is checked as being isolated where necessary in strict accordance with OH&S requirements and organization work procedures 2.4 ***Testing*** is conducted in accordance with principles and technology of ***electrical measurement*** 2.5 Test results are interpreted within the scope of required functionality and quality
3. Perform system inspection.	3.1 OHS risk control work measures and procedures are followed 3.2 System is checked as being isolated where necessary in strict accordance OH&S requirements and organization work procedures

	3.3 System is inspected for compliance with quality/industry standards 3.4 Work is completed in acceptable timeframe and given environment and workplace conditions
4. Report on system testing and inspection	4.1. Recommendations on repairs to defects are reported within the scope of established procedures 4.2. Report forms/data sheets on testing and inspection are completed accurately

Variable	**Range**
OHS policies and procedures	• Arrangements of an organization or enterprise to meet the legal and ethical obligations of ensuring that the workplace is safe and without risk to health. This may include: ▪ Hazardous and risk assessment mechanisms ▪ Implementation of safety regulations ▪ Safety training ▪ Safety systems incorporating - ▪ Work clearance procedures ▪ Isolation procedures ▪ Gas and vapor ▪ Monitoring/testing procedures ▪ Use of protective equipment and clothing ▪ Use of codes of practice
Documented	May include but not limited to: • Organization work procedures and manuals • Manufacturer's instruction manual • Customer requirements/specifications • Forms
inspection	May include but not limited to: Observation and measurements make sure the electronics system: • comply with OHS procedures • have safety signs and calibration of electronic apparatus • follow quality standards
System	The overall process of work including: • method by which the work is carried out • organization of the work • selection and maintenance of tools and equipment • supervision and training • selection of workers

	• allocation of tasks and responsibilities
Testing	Mainly include but not limited to: Measurements (current, voltage, resistance etc) conducted to ensure that the system is operating properly and efficiently under the specified conditions.
electrical measurement	May include but not limited to: • current, • voltage • resistance etc.
Environmental Requirements	• proper disposal of chemicals equipment and components shall be based on existing requirements of the law and chemicals waste management • non-biodegradable parts of materials shall be packed and labeled properly for disposal

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement • Conduct functional and quality tests on electronic systems and including: ▪ following job specifications ▪ selecting and using testing and measuring devices correctly ▪ interpreting test results ▪ identifying visual defects ▪ reporting test results ▪ recommending appropriate actions for dealing with defect apparatus ▪ dealing with unplanned events by drawing on ▪ essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items
Underpinning Knowledge and Attitudes	• Use of Schematic Diagram and Interpreting Schematic Symbols • System and Processes ▪ Occupational Health and Safety principles ▪ Electronic assembly functional and quality testing ▪ Fundamentals of Electronics ▪ Fundamentals of Computer Operation

	▪ Fundamentals of Microprocessors/Microcontroller and programmable logic control/PLC/ ▪ Fundamentals of Electromagnetic compatibility ▪ Electronic testing and measuring devices and techniques • Principle and application of different electronics components and circuit e.g. Amplifier, rectifier, regultor, diode, transistors • Safety ▪ Work safety requirements and economy of materials with durability ▪ Knowledge in basic safety application and observation of required timeframe • Materials, Tools and Equipment: Uses and Specifications ▪ Identification of appropriate tools, equipment and devices • Applied Mathematics • Laws and Regulations ▪ Regional / Local laws or regulations ▪ Ethiopia Electrical Code ▪ Federal legislations • Fundamental of management and economics ▪ Quality management system ▪ Purchasing system and costing technique ▪ Risk management, application and techniques
Underpinning Skills	• Work efficiency • Communication skills in interpreting service manual and dealing with the client • problem solving ability in basic electronic system • Skills in the use and maintenance of test instruments, tools and equipment • Applying work safety practices and time management • Interpreting schematic diagrams in relation to job requirements
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials, diagrams and manuals, tools, test instruments and equipment, and to information on workplace practices and OHS practices.
Assessment Methods	Competence may be assessed through: • Interview / oral questioning / written exam • Simulation/demonstration • Observation

Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting

TOP

Occupational Standard: Electrical/Electronic Equipment Servicing Management Level IV	
Unit Title	**Collect, Organize and Analyze Information**
Unit Code	**EEL EES4 10 0511**
Unit Descriptor	This unit defines the competence required to identify, analyze and document operation requirements. The competencies specified in this unit standard are applicable to organizations of the country categorized as micro, small, medium and large scale enterprises engaged in any electronic servicing.

Elements	Performance Criteria
1. Identify key information sources	1.1 Information repositories are identified across the business 1.2 Current ***organizational documentation*** are reviewed 1.3 Critical questions are developed to elicit information from key stakeholders using a mixture of open and closed questions 1.4 ***Information gathering techniques*** *are* ensured to use a quality assurance methodology and meet budgetary constraints
2. Gather data through formal and informal processes	1.1 Information gathering workshops and interviews are conducted to gather data 1.2 Reports and other data sources are reviewed for relevant business information 1.3 ***Business-critical factors*** relating to current and future directions of the organization are confirmed with stakeholders 1.4 Group and individual responses are analyzed to clearly define business priorities
3. Ensure analysis is accurate and complete	1.1 Information ***gathered*** are analyzed and evaluated for accuracy and consistency 1.2 Document conflicts in information are gathered 1.3 Conflicts in information or points of view are resolved with ***stakeholders***
4. Submit analysis and gain agreement	4.1 Detailed document according to ***documentation standards*** and organizational templates are prepared 4.2 2Document in a style are written that is succinct and appropriate to the audience 4.3 Data gathered are communicated to ***client*** to gain consensus

	and agreement on business requirements

Variable	Range
Tools	Electronic devices, computers, secondary storage devices
Organizational documentation	May include business forms, policy documents, financial statements, performance reports and annual reports
Information gathering techniques	May include but are not limited to interviews, questionnaires, surveys and observation
Stakeholders	May include sponsor, user, development team and project team
Client	May include but is not limited to internal departments, external organizations, individual people and employees
Documentation standards	May include but are not restricted to policy relating to sign-off, storage, distribution, revision Standards may include ISO/IEC/AS standards, organizational standards, project standards. May include tools for documenting (e.g. word processing packages, desk publishing packages)
Business-critical factors	May include response times, scalability, traffic, data knowledge and management, security, customer demographics, customer confidence and expectation
Company resources	• Consumable materials • Equipment/Machineries • Human • Financial resources

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate • Identified key information sources • Gathered data through different processes • Ensured analysis is accurate and complete • Submitted analysis and gained agreement

Underpinning Knowledge	• Knowledge of the client business domain, so that the business need is understood by project team and client • Knowledge of current industry systems development methodologies • Knowledge of the role of stakeholders and the degree of stakeholder involvement (e.g. when specifying people (especially the owner, sponsor and those that will contribute to defining the requirements and using the system), and roles of client users are identified
Underpinning Skills	• Current industry-accepted electronic products, including broad knowledge of general features and capabilities • Detailed skills of the system's current functionality (e.g. when specifying physical requirements of the system are identified taking into account current system functionality, geography, environment, client user and cost constraints) • Skills of quality assurance practices (e.g. when planning the requirements phase) • Interpersonal skills and Communication skills • Self-awareness, understanding and acceptance
Resource Implications	The following resources must be provided: • Workplace or fully equipped environment with necessary tools and equipment as well as consumable materials
Methods of Assessment	Competence may be assessed through: • Oral questioning / Interview • Demonstration/Observation
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting

TOP

Occupational Standard: Electrical/Electronic Equipment Servicing Management Level IV	
Unit Title	**Establish Quality Standards**
Unit Code	**EEL EES4 11 0511**
Unit Descriptor	This unit covers the knowledge, attitudes and skills required to monitor quality of work, establish quality specifications for work outcomes, participate in maintaining and improving quality at work, identify hazards and critical control points in the production of quality output, assist in planning of quality assurance procedures, report problems that affect quality and implement quality assurance procedures.

Elements	Performance Criteria
1. Establish quality specifications for service	1.1 Market specifications are **sourced** and ***legislated requirements*** identified. 1.2 Quality specifications developed and agreed upon 1.3 Quality specifications are documented and introduced to organization staff / personnel in accordance with the organization policy 1.4 Quality specifications are updated when necessary
2. Identify hazards and critical control points	2.1. Critical control points impacting on quality are identified. 2.2. Degree of risk for each hazard is determined. 2.3. Necessary documentation is accomplished in accordance with organization quality procedures
3. Assist in planning of quality assurance procedures	3.1 Procedures for each identified control point are developed to ensure optimum quality. 3.2 Hazards and risks are minimized through application of appropriate controls. 3.3 Processes to monitor the effectiveness of quality assurance procedures are developed.
4. Implement quality assurance procedures	4.1 Responsibilities for carrying out procedures are allocated to staff and contractors. 4.2 Instructions are prepared in accordance with the enterprise's quality assurance program. 4.3 Staff and contractors are given induction training on the quality assurance policy. 4.4 Staff and contractors are given in-service training relevant to their allocated procedures.
5. Monitor quality of work outcome	5.1 Quality requirements are identified 5.2 Inputs are inspected to confirm capability to meet quality requirements

	5.3 Work is conducted to produce required outcomes 5.4 Work processes are monitored to confirm quality of output and/or service 5.5 Processes are adjusted to maintain outputs within specification.
6. Participate in maintaining and improving quality at work	6.1 Work area, ***materials***, ***tool and equipment***, processes and product are routinely monitored to ensure compliance with quality requirements 6.2 Non-conformance in inputs, process, product and/or service is identified and reported according to workplace reporting requirements 6.3 Corrective action is taken within level of responsibility, to maintain quality standards 6.4 Quality issues are raised with designated personnel
7. Report problems that affect quality	7.1 Recognize potential or existing quality problems. 7.2 Identify instances of variation in quality from specifications or work instructions. 7.3 Report variation and potential problems to supervisor/manager according to enterprise guidelines.

Variables	**Range**
Sourced	• end-users • customers or stakeholders
Legislated requirements	• Verification of service quality as part of consumer legislation or specific legislation related to service content or composition.
Safety procedures	• use of tools and equipment for construction works • workplace environment and handling of material safety, • following occupational health and safety procedures designated for the task • respect the policies, regulations, legislations, rule and procedures for construction works
Materials	• gloves, bucket, scrubbing brush, gauze, cotton and plasters • aluminum foils, gowns, apron, rubber boots, disinfectants, antiseptics, scalpel blade, stationeries, tap water, alcohol, and soap, detergents, protective eyewear, overall, cleaning reagents cleaning materials
Tools and Equipment	• projector, white board, computers, printers, calculators, copying machines, bucket, wheelbarrow/trolley for disposal of carcass, different quality evaluating equipment

Evidence Guide	
Critical Aspect of Competence	Assessment requires evidence that the candidate: • Monitored quality of work • Established quality specifications for service • Participated in maintaining and improving quality at work • Identified hazards and critical control points in the production of quality service • Assisted in planning of quality assurance procedures • Reported problems that affect quality • Implemented quality assurance procedures
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • Monitoring quality of work • Establishing quality specifications for product • Participating in maintaining and improving quality at work • Identifying hazards and critical control points in the production of quality product • Assisting in planning of quality assurance procedures • Reporting problems that affect quality • Implementing quality assurance procedures
Underpinning Skills	Demonstrates skills in: • Monitoring quality of work • Establishing quality specifications for service • Participating in maintaining and improving quality at work • Identifying hazards and critical control points in the production of quality service • Assisting in planning of quality assurance procedures • Reporting problems that affect quality • Implementing quality assurance procedures
Resource Implications	The following resources must be provided: • Workplace or fully equipped environment with necessary tools and equipment as well as consumable materials
Assessment Methods	Competence may be assessed through: • interview/ Written Test • Demonstration/Observation with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting

TOP

Occupational Standard: Electrical/Electronic Equipment Servicing Management Level IV	
Unit Title	**Develop Individuals and Teams**
Unit Code	**EEL EES4 12 0511**
Unit Descriptor	This unit covers the skills, knowledge and attitudes required to determine individual and team development needs and facilitate the development of the workgroup.

Elements	Performance Criteria
1. Provide team leadership	1.1 ***Learning and development needs*** are systematically identified and implemented in line with ***organizational requirements*** 1.2 Learning plan to meet individual and group training and developmental needs is collaboratively developed and implemented 1.3 Individuals are encouraged to self evaluate performance and identify areas for improvement 1.4 ***Feedback on performance*** of team members is collected from relevant sources and compared with established team learning process
2. Foster individual and organizational growth	2.1 Learning and development program goals and objectives are identified to match the specific knowledge and skills requirements of Competence standards 2.2 ***Learning delivery methods*** are appropriate to the learning goals, the learning style of participants and availability of equipment and resources 2.3 Workplace learning opportunities and coaching/ mentoring assistance are provided to facilitate individual and team achievement of competencies 2.4 Resources and timelines required for learning activities are identified and approved in accordance with organizational requirements

3. Monitor and evaluate workplace learning	3.1 Feedback from individuals or teams is used to identify and implement improvements in future learning arrangements 3.2 Outcomes and performance of individuals/teams are assessed and recorded to determine the effectiveness of development programs and the extent of additional support 3.3 Modifications to learning plans are negotiated to improve the efficiency and effectiveness of learning 3.4 Records and reports of Competence are maintained within organizational requirement
4. Develop team commitment and cooperation	4.1 Open communication processes to obtain and share information is used by team 4.2 Decisions are reached by the team in accordance with its agreed roles and responsibilities 4.3 Mutual concern and camaraderie are developed in the team
5. Facilitate accomplishment of organizational goals	5.1 Team members actively participated in team activities and communication processes 5.2 Teams members developed individual and joint responsibility for their actions 5.3 Collaborative efforts are sustained to attain organizational goals

Variable	**Range**
Learning and development needs	• Coaching, monitoring and/or supervision • Formal/informal learning program • Internal/external training provision • Work experience/exchange/opportunities • Personal study • Career planning/development • Performance evaluation • Workplace skills assessment • Recognition of prior learning
Organizational requirements	• Quality assurance and/or procedures manuals • Goals, objectives, plans, systems and processes • Legal and organizational policy/guidelines and requirements • Safety policies, procedures and programs • Confidentiality and security requirements • Business and performance plans • Ethical standards • Quality and continuous improvement processes and standards

Feedback on performance	• Formal/informal performance evaluation • Obtaining feedback from supervisors and colleagues • Obtaining feedback from clients • Personal and reflective behavior strategies • Routine and organizational methods for monitoring service delivery
Learning delivery methods	• On the job coaching or monitoring • Problem solving • Presentation/demonstration • Formal course participation • Work experience • Involvement in professional networks • Conference and seminar attendance

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • Identified and implemented learning opportunities for others • Gave and received feedback constructively • Facilitated participation of individuals in the work of the team • Negotiated plans to improve the effectiveness of learning • Prepared learning plans to match skill needs • Accessed and designated learning opportunities
Underpinning Knowledge and Attitude	Demonstrates knowledge of: • coaching and monitoring principles • understanding how to work effectively with team members who have diverse work styles, aspirations, cultures and perspective • understanding how to facilitate team development and improvement • understanding methods and techniques to obtain and interpreting feedback • understanding methods for identifying and prioritizing personal development opportunities and options • knowledge of career paths and competence standards in the industry
Underpinning Skills	Demonstrates skills to: • ability to read and understand a variety of texts, prepare general information and documents according to target audience; spell with accuracy; use grammar and punctuation effective relationships and conflict management • communication skills including receiving feedback and reporting, maintaining effective relationships and conflict

	management • planning skills to organize required resources and equipment to meet learning needs • coaching and mentoring skills to provide support to colleagues • reporting skills to organize information; assess information for relevance and accuracy; identify and elaborate on learning outcomes • facilitation skills to conduct small group training sessions • ability to relate to people from a range of social, cultural, physical and mental backgrounds
Resource Implications	Access to relevant workplace or appropriately simulated environment where assessment can take place
Assessment Methods	Competence may be accessed through: • Interview / Written test • Observation / Demonstration
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting

TOP

Occupational Standard: Electrical/Electronic Equipment Servicing Management Level IV	
Unit Title	**Utilize Specialized Communication Skills**
Unit Code	**EEL EES4 13 0511**
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to use specialized communication skills to meet specific needs of internal and external clients, conduct interviews, facilitate group discussions, and contribute to the development of communication strategies.

Elements	Performance Criteria
1. Meet common and specific communication needs of clients and colleagues	1.1 Specific communication needs of clients and colleagues are identified and met 1.2 Different approaches are used to meet communication needs of clients and colleagues 1.3 Conflict is addressed promptly and in a timely way and in a manner which does not compromise the standing of the organization
2. Contribute to the development of communication strategies	2.1 ***Strategies*** for internal and external dissemination of information are developed, promoted, implemented and reviewed as required 2.2 Channels of communication are established and reviewed regularly 2.3 Coaching in effective communication is provided 2.4 Work related network and relationship are maintained as necessary 2.5 Negotiation and conflict resolution strategies are used where required 2.6 Communication with clients and colleagues is appropriate to individual needs and organizational objectives

3. Represent the organization	3.1 When participating in internal or external forums, presentation is relevant, appropriately researched and presented in a manner to promote the organization 3.2 Presentation is clear and sequential and delivered within a predetermined time 3.3 Utilize appropriate media to enhance presentation 3.4 Differences in views are respected 3.5 Written communication is consistent with organizational standards 3.6 Inquiries are responded in a manner consistent with organizational standard
4. Facilitate group discussion	4.1 Mechanisms which enhance ***effective group interaction*** is defined and implemented 4.2 Strategies which encourage all group members to participate are used routinely 4.3 Objectives and agenda for meetings and discussions are routinely set and followed 4.4 Relevant information is provided to group to facilitate outcomes 4.5 Evaluation of group communication strategies is undertaken to promote participation of all parties 4.6 Specific communication needs of individuals are identified and addressed
5. Conduct interview	5.1 A range of appropriate communication strategies are employed in ***interview situations*** 5.2 Records of interviews are made and maintained in accordance with organizational procedures 5.3 Effective questioning, listening and nonverbal communication techniques are used to ensure that required message is communicated

Variable	**Range**
Strategies	• Recognizing own limitations • Utilizing techniques and aids • Providing written drafts • Verbal and non verbal communication
Effective group interaction	• Identifying and evaluating what is occurring within an interaction in a non judgmental way • Using active listening • Making decision about appropriate words, behavior • Putting together response which is culturally appropriate • Expressing an individual perspective • Expressing own philosophy, ideology and background and exploring impact with relevance to communication

Types of Interview	• Related to staff issues • Routine • Confidential • Evidential • Non-disclosure • Disclosure
Interview situations	• Establish rapport • obtain facts and information • Facilitate resolution of issues • Develop action plans • Diffuse potentially difficult situation

Evidence Guide	
Critical Aspects of Competence	Assessment requires evidence that the candidate: • Demonstrated effective communication skills with clients accessing service and work colleagues • Adopted relevant communication techniques and strategies to meet client particular needs and difficulties
Underpinning Knowledge and Values	Demonstrates knowledge of: • Communication process • Dynamics of groups and different styles of group leadership • Communication skills relevant to client groups
Underpinning Skills	Demonstrates skills of: • Full range of communication techniques including: ▪ Full range of communication ▪ Active listening ▪ Feedback ▪ Interpretation ▪ Role boundaries setting ▪ Negotiation ▪ Establishing empathy • Communication skills required to fulfill job roles as specified by the organization
Resource Implications	The following resources must be provided: • Workplace or fully equipped assessment location with necessary tools and equipment as well as consumable materials
Methods of Assessment	Competence may be assessed through: • Observation / demonstration with oral questioning • Interview / written test
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting

TOP

Occupational Standard: Electrical/Electronic Equipment Servicing Management Level IV	
Unit Title	**Manage and Maintain Small/Medium Business Operation**
Unit Code	**EEL EES4 14 0511**
Unit Descriptor	This unit covers the operation of day-to-day business activities in a micro or small business. The strategies involve developing, monitoring and managing work activities and financial information, developing effective work habits, and adjusting work schedules as needed.

Elements	Performance Criteria
2. Identify daily work requirements	1.1 Work requirements for a given time period are identified taking into consideration ***resources*** and constraints 1.2 Work activities are prioritized based on business needs, requirements and deadlines 1.3 If appropriate, work is allocated to relevant staff or contractors to optimize efficiency
3. Monitor and manage work	2.1 People, resources and/or equipment are coordinated to provide optimum results 2.2 Staff, clients and/or contractors are communicated within a clear and regular manner, to monitor work in relation to ***business goals*** or timelines 2.3 ***Problem solving techniques*** are applied to work situations to overcome difficulties and achieve positive outcomes
4. Develop effective work habits	3.1 Work and personal priorities are identified and a balance is achieved between competing priorities using appropriate ***time management strategies*** 3.2 Input from ***internal and external sources*** is sought and used to develop and refine new ideas and approaches 3.3 Business or inquiries are responded to promptly and effectively 3.4 Information is presented in a format appropriate to the industry and audience
5. Interpret financial information	4.1 Relevant documents and reports are identified 4.2 Documents and reports are read and understood and any implications discussed with appropriate persons 4.3 Data and numerical calculations are analyzed, checked,

	evaluated, organized and reconciled 4.4 Daily financial records and cash flow are maintained correctly and in accordance with legal and accounting requirements 4.5 Invoices and payments are prepared and distributed in a timely manner and in accordance with legal requirements 4.6 Outstanding accounts are collected or followed-up on
6. Evaluate work performance	5.1 Opportunities for improvements are monitored according to business demands 5.2 Work schedules are adjusted to incorporate necessary modifications to existing work and routines or changing needs and requirements 5.3 Proposed changes are clearly communicated and recorded to aid in future planning and evaluation 5.4 Relevant codes of practice are used to guide an ethical approach to workplace practices and decisions

Variables	**Range**
Resources may include:	• staff • money • time • equipment • space
Business goals may include:	• sales targets • budgetary targets • team and individual goals • production targets • reporting deadlines
Problem solving techniques may include:	• gaining additional research and information to make better informed decisions • looking for patterns • considering related problems or those from the past and how they were handled • eliminating possibilities • identifying and attempting sub-tasks • collaborating and asking for advice or help from additional sources
Time management strategies may include:	• prioritizing and anticipating • short term and long term planning and scheduling • creating a positive and organized work environment • clear timelines and goal setting that is regularly reviewed and adjusted as necessary • breaking large tasks into smaller tasks • getting additional support if identified and necessary

Internal and external sources may include:	• staff and colleagues • management, supervisors, advisors or head office • relevant professionals such as lawyers, accountants, management consultants • professional associations

Evidence Guide	
Critical Aspects of Competence	A person must be able to demonstrate: • ability to identify daily work requirements and allocate work appropriately • ability to interpret financial documents in accordance with legal requirements
Underpinning Knowledge and Attitudes	• Federal and Local Government legislative requirements affecting business operations, especially in regard to occupational health and safety (OH&S), equal employment opportunity (EEO), industrial relations and anti-discrimination • technical or specialist skills relevant to the business operation • relevant industry code of practice • planning techniques to establish realistic timelines and priorities • identification of relevant performance measures • quality assurance principles and methods • relevant marketing, management, sales and financial concepts • methods for monitoring performance and implementing improvements • structured approaches to problem solving, idea management and time management
Underpinning Skills	• literacy skills to interpret legal requirements, company policies and procedures and immediate, day-to-day demands • communication skills including questioning, clarifying, reporting, and giving and receiving constructive feedback • numeracy skills for performance information, setting targets and interpreting financial documents and reports • technical and analytical skills to interpret business documents, reports and financial statements and projections • ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities • problem solving skills to develop contingency plans • using computers and software packages to record and manage data and to produce reports • evaluation skills for assessing work and outcomes • observation skills for identifying appropriate people, resources and to monitor work
Resource	The following resources should be provided:

Implications	• Access to relevant workplace documentation, financial records, and equipment
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation/Demonstration with Oral questioning
Context for Assessment	Competence may be assessed in the workplace or in a simulated work environment

TOP

Occupational Standard: Electrical/Electronic Equipment Servicing Management Level IV	
Unit Title	**Migrate to New Technology**
Unit Code	**EEL EES4 15 0511**
Unit Descriptor	This unit defines the competence required to apply skills and knowledge in using new or upgraded technology. The rationale behind this unit emphasizes the importance of constantly reviewing work processes, skills and techniques in order to ensure that the quality of the entire business process is maintained at the highest level possible through the appropriate application of new technology. To this end, the person is typically engaged in on-going review and research in order to discover and apply new technology or techniques to improve aspects of the organization's activities.

Elements	Performance Criteria
1. Apply existing knowledge and techniques to technology and transfer	1.1 Situations are identified where existing knowledge can be used as the basis for developing new skills. 1.2 New or upgraded technology skills are acquired and used to enhance learning. 1.3 New or upgraded equipment are identified, classified and used where appropriate, for the benefit of the organization.
2. Apply functions of technology to assist in solving organizational problems	2.1 Testing of new or upgraded equipment is conducted according to the specification manual. 2.2 Features of new or upgraded equipment are applied within the organization 2.3 Features and functions of new or upgraded equipment is used for solving organizational problems 2.4 Sources of information is accessed and used relating to new or upgraded equipment
3. Evaluate new or upgraded technology performance	3.1 New or upgraded equipment is evaluated for performance, usability and against OHS standards**.** 3.2 ***Environmental considerations*** are determined from new or upgraded equipment. 3.3 ***Feedback*** is sought from users where appropriate.

Variables	Range

Environmental Considerations	May include but is not limited to recycling, safe disposal of packaging (e.g. cardboard, polystyrene, paper, plastic) and correct disposal of waste materials by an authorized body
Feedback	May include surveys, questionnaires, interviews and meetings.

Evidence Guide	
Critical Aspects of Competence	Competence must confirm the ability to transfer the application of existing skills and knowledge to new technology
Underpinning Knowledge and Attitudes	• Broad awareness of current technology trends and directions in construction industry (e.g. systems/procedures, services, new developments, new protocols) • Knowledge of vendor product directions • Ability to locate appropriate sources of information regarding building construction and new technologies • Current industry products/services, procedures and techniques with knowledge of general features • Information gathering techniques
Underpinning Skills	• Research skills for identifying broad features of new technologies • Ability to assist in the decision making process • Literacy skills in regard to interpretation of technical manuals • Ability to solve known problems in a variety of situations and locations • Evaluate and apply new technology to assist in solving organizational problems • General analytical skills in relation to known problems
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Assessment Methods	Competency may be assessed through: • Interview / Written Test • Demonstration/ Observation with Oral Questioning
Context of Assessment	Competency may be assessed in the work place or in a simulated work place setting

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Occupational Standard: Electrical/Electronic Equipment Servicing Management Level IV	
Unit Title	**Manage Continuous Improvement System**
Unit Code	**EEL EES4 16 1012**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to sustain and develop an environment in which continuous improvement, innovation and learning are promoted and rewarded.

Elements	Performance Criteria
1. Review programs, systems and processes	1.1 Establish strategies to monitor and evaluate performance of key systems and processes 1.2 Undertake detailed analyses of supply chains, operational and product/service delivery systems 1.3 Identify performance measures, and assessment tools and techniques, and evaluate their effectiveness 1.4 Analyze performance reports and variance from plans for all key result areas of the organization 1.5 Identify and analyze changing trends and opportunities relevant to the organization 1.6 Seek advice from specialists, where appropriate, to identify technology and electronic commerce opportunities
2. Develop options for continuous improvement	2.1 Brief groups on performance improvement strategies and innovation as an essential element of competition 2.2 Foster ***creative climate*** and ***organizational learning*** through the promotion of interaction within and between work groups 2.3 Encourage, test and recognize new ideas and entrepreneurial behavior where successful 2.4 Accept failure of an idea during trialing, and recognize, celebrate and embed success into systems 2.5 Undertake ***risk management*** and ***cost benefit analyses*** for each option/idea approved for trial 2.6 Approve innovations through agreed organizational processes
3. Implement innovative processes	3.1 Promote continuous improvement as an essential part of doing business 3.2 Address impact of change and consequences for people, and implement transition plans 3.3 Ensure objectives, timeframes, measures and communication plans are in place to manage

	implementation 3.4 Implement contingency plans in the event of non-performance 3.5 Follow-up failure by prompt investigation and analysis of causes 3.6 Manage emerging challenges and opportunities effectively 3.7 Evaluate continuous improvement systems and processes regularly 3.8 Communicate costs and benefits of innovations and improvements to all relevant groups and individuals

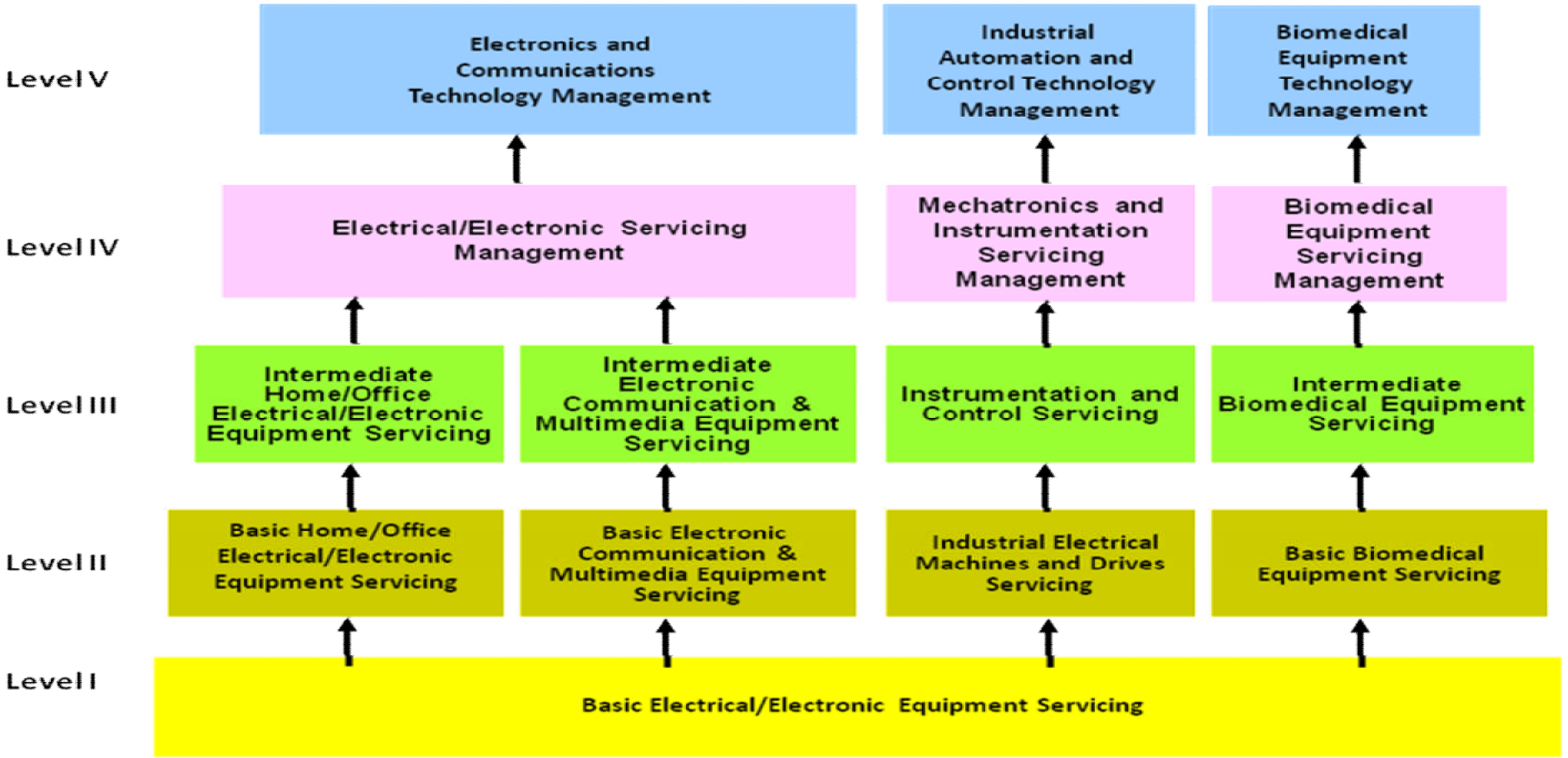
Variable	**Range**
Sustainability may include:	• addressing environmental and resource sustainability initiatives, such as environmental management systems, action plans, green office programs, surveys and audits • applying the waste management hierarchy in the workplace • complying with regulations and corporate social responsibility considerations for sustainability to enhance the organisation's standing in business and community environments • determining organisation's most appropriate waste treatment, including waste to landfill, recycling, re-use, recoverable resources and wastewater treatment • implementing ecological footprint • implementing environmental management systems, e.g. ISO 14001:1996 Environmental management systems life cycle analyses • implementing government initiatives, • improving resource and energy efficiency • initiating and maintaining appropriate organisational procedures for operational energy consumption • introducing a green office program - a cultural change program • introducing green purchasing • introducing national and international reporting initiatives, • introducing product stewardship • reducing emissions of greenhouse gases • reducing use of non-renewable resources • referencing standards, guidelines and approaches, such as sustainability covenants and compacts or triple bottom line reporting • supporting sustainable supply chain.
Supply chains include:	• network of facilities that procures raw materials, transforms them into intermediate products or services and then

	finished goods or service, and delivers them through a distribution system • procurement, production and distribution, viewed as interlinked not as discrete elements
Performance reports may include:	• budget or cost variance • customer service • environmental • financial • OHS • quality • other operating parameters

Evidence Guide	
Critical Aspects of Competence	Evidence of the following is essential: • demonostration of consultation processes to introduce or evaluate an existing continuous improvement process or system, including suggested actions or an action plan • generation of an idea or concept which exhibits creative thinking and which offers the possibility of advantaging the organization • how the concept or idea was introduced, tested and evaluated - the idea or concept does not have to have been shown to work or to be adopted by the business • knowledge of quality management and continuous improvement theories
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • quality management and continuous improvement theories • creativity/innovation theories/concepts • risk management • cost-benefit analysis methods • creativity and innovation theories and concepts • organizational learning principles • quality management and continuous improvement theories • risk management • sustainability practices
Underpinning Skills	Demonstrates skills to: • analytical skills to identify improvement opportunities in relation to • the services/products delivered or concepts/ideas developed • flexibility and creativity skills to think laterally • leadership skills to foster a commitment to quality and an openness to innovation • teamwork and leadership skills to foster a commitment to quality and an openness to innovation

Resources Implication	Access may be required to: • workplace procedures and plans relevant to work area • appropriate documentation and resources normally used in the workplace
Methods of Assessment	Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • suitable simulation • oral or written questioning to assess knowledge of principles and techniques associated with change management • evaluation of strategies established to monitor and evaluate performance of key systems and processes • review of briefing of groups on performance improvement strategies and innovation Those aspects of competence dealing with improvement processes could be assessed by the use of suitable simulations and/or a pilot plant and/or a range of case studies and scenarios. In all cases, practical assessment should be supported by questions to assess essential knowledge and those aspects of competence which are difficult to assess directly.
Context of Assessment	Competence may be assessed in the work place or in a simulated workplace setting / environment.

Sector: Electrotechnology and Telecommunication
Sub-Sector: Electrotechnology



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